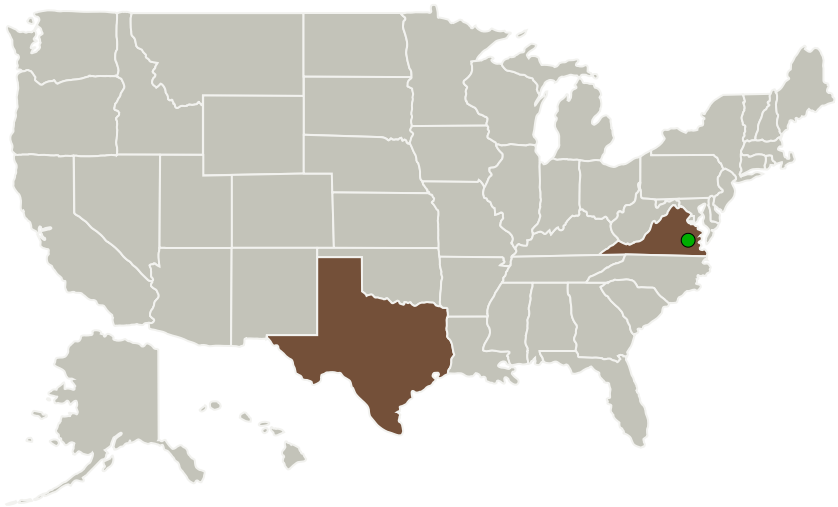
Integrated Miniature DBR Laser Module for Lidar Instruments, Phase II

Completed Technology Project (2016 - 2018)

Project Introduction

The technical objectives of the phase II effort include the fabrication of precision DBR lasers and the prototype of compact hybrid optical module. Task 1. 828nm DBR laser fabrication. Based on the performance of qualified epi material, the 828nm DBR architecture will be optimized. We will proceed to laser fabrication with current best practices. Task 2. Device reliability and lifetime testing We plan for accelerated lifetime testing of up to 128 devices to obtain the various activation energy describing device performance under different conditions. Task 3. Hybrid optical module design. Photodign will work with a subcontractorto to develop hybrid optical packaging. The optimized design will integrate the DBR laser with collimating lenses, built-in isolator and fiber coupling into a custom hybrid housing. Task 4. Hybrid optical module evaluation Primary characteristics of the hybrid optical module include high optical efficiency and narrow linewidth, which will be evaluated upon the delivery of prototype units. Task 5. Additional 815nm ? 820nm DBR laser fabrication. DBR laser fabrication is proposed at this wavelength for offering prototype devices for air borne LIDARs. Task 6. Prototype delivery and production readiness. Deliverables will include three prototype 828nm hybrid packaged DBR laser modules and three prototype 815-820nm DBR laser devices.

Primary U.S. Work Locations and Key Partners



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Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
Photodigm, Inc.	Lead Organization	Industry	Richardson, Texas
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
Texas	Virginia

Project Transitions

April 2016: Project Start

July 2018: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139760)*

Images

Briefing Chart Image
Integrated Miniature DBR Laser Module for Lidar Instruments, Phase II
(https://techport.nasa.gov/image/135357)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Photodigm, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

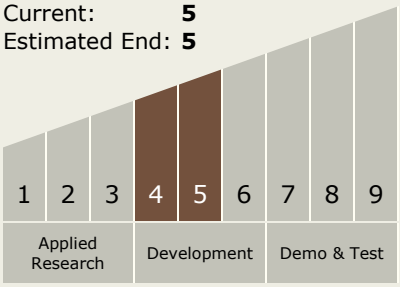
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Annie Xiang

Technology Maturity (TRL)

Start: **4**
Current: **5**
Estimated End: **5**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.3 In-Situ Instruments and Sensors
    - TX08.3.4 Environment Sensors

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System